



## CONTENTS OF VOLUME 131

### Vol. 131A No. 1

**Special Issue: Learning about the Comparative Biomechanics of Locomotion and Feeding: Symposium from ESCPB Congress, Liège, Belgium, July 24–28, 2000**  
Guest Editors: A.P. Russell and V. Bels

#### Symposium papers

- |   |     |  |
|---|-----|--|
| A.P. Russell and V. Bels                                | 1   | Introduction to the Symposium – Learning about the comparative biomechanics of locomotion and feeding  |
| J. Paul   | 7   | Mandible movements in ants   |
| V. Deveaux, I. Cassar-Malek and B. Picard               | 21  | Comparison of contractile characteristics of muscle from Holstein and double-muscled Belgian Blue foetuses   |
| J.M. Wakeling   | 31  | Biomechanics of fast-start swimming in fish  |
| I. Plaut  | 41  | Critical swimming speed: its ecological relevance  |
| J.-Y. Cheng and G.L. Chahine                            | 51  | Computational hydrodynamics of animal swimming: boundary element method and three-dimensional vortex wake structure  |
| G.B. Gillis and R.W. Blob                               | 61  | How muscles accommodate movement in different physical environments: aquatic vs. terrestrial locomotion in vertebrates   |
| F.-O. Lehmann   | 77  | The efficiency of aerodynamic force production in <i>Drosophila</i>  |
| A.P. Russell and V. Bels                                | 89  | Biomechanics and kinematics of limb-based locomotion in lizards: review, synthesis and prospectus  |
| A. Abourachid   | 113 | Kinematic parameters of terrestrial locomotion in cursorial (ratites), swimming (ducks), and striding birds (quail and guinea fowl)  |
| J.-P. Gasc  | 121 | Comparative aspects of gait, scaling and mechanics in mammals  |
| P. Neveu, J. Villanova and J.P. Gasc                    | 135 | Modélisation of an unspecialised quadruped walking mammal  |
| C. Berge and E. Daynes                                  | 145 | Modeling three-dimensional sculptures of australopithecines ( <i>Australopithecus afarensis</i> ) for the Museum of Natural History of Vienna (Austria): the post-cranial hypothesis |
| A. Casinos and J. Cubo                                  | 159 | Avian long bones, flight and bipedalism  |
| P. Domenici   | 169 | The scaling of locomotor performance in predator–prey encounters: from fish to killer whales   |
| R.J. Wassersug and M. Yamashita                         | 183 | Plasticity and constraints on feeding kinematics in anuran larvae  |
| R.G. Bout and G.A. Zweekers                             | 197 | The role of cranial kinesis in birds   |
| S.W. Herring, K.L. Rafferty, Z.J. Liu and C.D. Marshall | 207 | Jaw muscles and the skull in mammals: the biomechanics of mastication  |
|   | I   | Instructions to Authors  |

### Vol. 131A, No. 2

#### General papers

- |                                       |     |  |
|---------------------------------------|-----|--|
| E. Casado, J. Balbontin and M. Ferrer | 221 | In Appreciation  |
|                                       | 233 | Plasma chemistry in booted eagle ( <i>Hieraaetus pennatus</i> ) during breeding season |

B. Pratoomchat, P. Sawangwong, P. Pakkong and J. Machado	243	Organic and inorganic compound variations in haemolymph, epidermal tissue and cuticle over the molt cycle in <i>Scylla serrata</i> (Decapoda)
S.L. Edwards, J.A. Donald, T. Toop, M. Donowitz and C.-M. Tse	257	Immunolocalisation of sodium/proton exchanger-like proteins in the gills of elasmobranchs
T. Matsuura and I. Kanno	267	Effect of nitric oxide synthase inhibitor on the local cerebral blood flow evoked by rat somatosensory stimulation under hyperoxia
E.J. Miranda and J.R. Hazel	275	The effect of acclimation temperature on the fusion kinetics of lipid vesicles derived from endoplasmic reticulum membranes of rainbow trout ( <i>Oncorhynchus mykiss</i> ) liver
H. Kagami, J. Iwata, J. Yasuda and T. Ono	287	Strain preference in donor and recipient for production of W-bearing sperm in mixed-sex germline chimeric chickens
C. Alonso-Alvarez, M. Ferrer, J. Figuerola, J.A.R. Veira, J. Estepa and L.M. Torres	293	The effects of testosterone manipulation on the body condition of captive male yellow-legged gulls
A.G. Jeffs, C.F. Phleger, M.M. Nelson, B.D. Mooney and P.D. Nichols	305	Marked depletion of polar lipid and non-essential fatty acids following settlement by post-larvae of the spiny lobster <i>Jasus verreauxi</i>
M.H. Routley, G.E. Nilsson and G.M.C. Renshaw	313	Exposure to hypoxia primes the respiratory and metabolic responses of the epaulette shark to progressive hypoxia
L.B. Lopez, L.E.M. Quintas and F. Noël	323	Influence of development on $\text{Na}^+/\text{K}^+$ -ATPase expression: isoform- and tissue-dependency
X.-F. Liang, H. Oku and H.Y. Ogata	335	The effects of feeding condition and dietary lipid level on lipoprotein lipase gene expression in liver and visceral adipose tissue of red sea bream <i>Pagrus major</i>
M.G. Wheatly, M.G. Hubbard and A.M. Corbett	343	Physiological characterization of the $\text{Na}^+/\text{Ca}^{2+}$ exchanger (NCX) in hepatopancreatic and antennal gland basolateral membrane vesicles isolated from the freshwater crayfish <i>Procambarus clarkii</i>
S. Guynn, F. Dowd and D. Petzel	363	Characterization of gill $\text{Na}/\text{K}$ -ATPase activity and ouabain binding in Antarctic and New Zealand notothenioid fishes
K.P. Choe, A.I. Morrison-Shetlar, B.P. Wall and J.B. Claiborne	375	Immunological detection of $\text{Na}^+/\text{H}^+$ exchangers in the gills of a hagfish, <i>Myxine glutinosa</i> , an elasmobranch, <i>Raja erinacea</i> , and a teleost, <i>Fundulus heteroclitus</i>
A. Orozco, P. Villalobos and C. Valverde-R	387	Environmental salinity selectively modifies the outer-ring deiodinating activity of liver, kidney and gill in the rainbow trout
H. Schapker, T. Breithaupt, Z. Shuranova, Y. Burmistrov and R.L. Cooper	397	Heart and ventilatory measures in crayfish during environmental disturbances and social interactions
J.-M. Weber, G. Brichon, J. Bodennec and G. Zwingelstein	409	Palmitate and oleate metabolism of rainbow trout in vivo
E. Schleucher	417	Metabolism, body temperature and thermal conductance of fruit-doves (Aves: Columbidae, Treroninae)
N. Hiramatsu, K. Hiramatsu, K. Hirano and A. Hara	429	Vitellogenin-derived yolk proteins in a hybrid sturgeon, bester ( <i>Huso huso</i> x <i>Acipenser ruthenus</i> ): Identification, characterization and course of proteolysis during embryogenesis
B.F. Terjesen, R.N. Finn, B. Norberg and I. Ronnestad	443	Kinetics and fates of ammonia, urea, and uric acid during oocyte maturation and ontogeny of the Atlantic halibut ( <i>Hippoglossus hippoglossus</i> L.)
M.S. Rea, H. Bauby, S. Babar and R.H. Parsons	457	Effects of nitric oxide and angiotensin II and their interaction on water uptake in <i>Rana catesbeiana</i>
R.J. Balment, M.A. Masini, M. Vallarino and J.M. Conlon	467	Cardiovascular actions of lungfish bradykinin in the unanaesthetised African lungfish, <i>Protopterus annectens</i>
I		Instructions to Authors

## Vol. 131A, No. 3

Papers from the Extremophiles Symposium  
ESCPB 21st Congress, Liège, Belgium, July 24–28, 2000

M. Horowitz	475	From molecular and cellular to integrative heat defense during exposure to chronic heat
M. Roberts, T. Rivers, S. Oliveria, P. Texeira and E. Raman	485	Adrenoceptor and local modulator control of cutaneous blood flow in thermal stress
Y. Arieli, L. Peltonen and E. Ophir	497	Cooling by cutaneous water evaporation in the heat-acclimated rock pigeon ( <i>Columba livia</i> )
L.M. Crowe	505	Lessons from nature: the role of sugars in anhydrobiosis
A.E. Oliver, D.K. Hinch and J.H. Crowe	515	Looking beyond sugars: the role of amphiphilic solutes in preventing adventitious reactions in anhydrobiotes at low water contents
E.A. Hoekstra and E.A. Golovina	527	The role of amphiphiles
W.F. Wolters, F. Tablin and J.H. Crowe	535	From anhydrobiosis to freeze-drying of eukaryotic cells
E.A. Golovina and E.A. Hoekstra	545	Membrane behavior as influenced by partitioning of amphiphiles during drying: a comparative study in anhydrobiotic plant systems
L. Camardella, R. Di Fraia, A. Antignani, M.A. Ciardiello, G. di Prisco, J.K. Coleman, L. Buchon, J. Guespin and N.J. Russell	559	The Antarctic <i>Psychrobacter</i> sp. TAD1 has two cold-active glutamate dehydrogenases with different cofactor specificities. Characterisation of the NAD <sup>+</sup> -dependent enzyme
M. Tini, U.R. Jewell, G. Camenisch, D. Chilov and M. Gassmann	569	Generation and application of chicken egg-yolk antibodies
P. Sebert	575	Fish at high pressure: a hundred year history
A.G. Macdonald	587	Ion channels under high pressure
R. Eicher and H. Ludwig	595	Influence of activation and germination on high pressure inactivation of ascospores of the mould <i>Eurotium repens</i>
D.M. Pampanin, L. Ballarin, L. Carotenuto and M.G. Marin	605	Air exposure and functionality of <i>Chamelea gallina</i> haemocytes: effects on haematocrit, adhesion, phagocytosis and enzyme contents
A. de Zwaan, J.M.F. Babarro, M. Monari and O. Cattani	615	Anoxic survival potential of bivalves: (arte)facts
<i>General papers</i>		
P.C. Dooley, P.J. Crouch and J.M. West	625	Free amino acids in claw muscle and haemolymph from Australian freshwater crayfish at different stages of the moult cycle
J.B. Andersen and T. Wang	639	Effects of anaesthesia on blood gases, acid-base status and ions in the toad <i>Bufo marinus</i>
E.J. Bennett and S.M. Jones	647	Interrelationships among plasma progesterone concentrations, luteal anatomy and function, and placental ontogeny during gestation in a viviparous lizard ( <i>Niveoscincus metallicus</i> : Scincidae)
D. Jamroz, K. Jakobsen, K.E.B. Knudsen, A. Wilczkiewicz and J. Orda	657	Digestibility and energy value of non-starch polysaccharides in young chickens, ducks and geese, fed diets containing high amounts of barley
H. Shimizu	669	Feeding and wounding responses in <i>Hydra</i> suggest functional and structural polarization of the tentacle nervous system
X.B. Wen, L.Q. Chen, Z.L. Zhou, C.X. Ai and G.Y. Deng	675	Reproduction response of Chinese mitten-handed crab ( <i>Eriocheir sinensis</i> ) fed different sources of dietary lipid
S. Blanc, S. Normand, C. Pachiaudi, G. Gauquelin-Koch, C. Gharib and L. Somody	683	Energy expenditure and blood flows in thermoregulatory organs during microgravity simulation in rat. Emphasis on the importance of the control group
I		Instructions to Authors

Papers from the Perinatal Development of Birds Symposium  
6th International workshop, Berlin, October 12-16, 2000  
Guest editors: M. Nichelmann, B. Tzschentke and H. Tönhardt

Introduction

- M. Nichelmann, B. Tzschentke and H. Tönhardt 697 Perinatal development of control systems in birds

Symposium papers

- D. von Blumröder and H. Tönhardt 701 Influence of long-term changes in incubation temperature on catecholamine levels in plasma of chicken embryos (*Gallus gallus f. domestica*)
- E.M. Dzialowski, D. von Plettenberg, N.A. Elmonoufy and W.W. Burggren 713 Chronic hypoxia alters the physiological and morphological trajectories of developing chicken embryos
- R. Prinzing and V. Dietz 725 Pre- and postnatal energetics of the North Island brown kiwi (*Apteryx mantelli*)
- E. Hohtola 733 Facultative and obligatory thermogenesis in young birds: a cautionary note
- O. Janke, B. Tzschentke, J. Höchel and M. Nichelmann 741 Metabolic responses of chicken and muscovy duck embryos to high incubation temperatures
- M. Nichelmann and B. Tzschentke 751 Ontogeny of thermoregulation in precocial birds
- C. Duchamp, J.-L. Rouanet and H. Barré 765 Ontogeny of thermoregulatory mechanisms in king penguin chicks (*Aptenodytes patagonicus*)
- K. Kato, K. Moriya, E. Dzialowski, W.W. Burggren and H. Tazawa 775 Cardiac rhythms in prenatal and perinatal emu embryos
- K. Moriya, K. Kato, M. Matsumura, E. Dzialowski, W.W. Burggren and H. Tazawa 787 Cardiac rhythms in developing emu hatchlings
- H. Tazawa, K. Moriya, A. Tamura and R. Akiyama 797 Low-frequency oscillation of instantaneous heart rate in newly hatched chicks
- J. Höchel, R. Pirow and M. Nichelmann 805 Development of heart rate responses to acoustic stimuli in Muscovy duck embryos
- Y. Chiba, A.H. Khandoker, M. Nobuta, K. Moriya, R. Akiyama and H. Tazawa 817 Development of respiratory rhythms in perinatal chick embryos
- B. Tzschentke and D. Basta 825 Early development of neuronal hypothalamic thermosensitivity in birds: influence of epigenetic temperature adaptation
- R. Grossmann, A. Jurkevich and A. Köhler 833 Sex dimorphism in the avian arginine vasotocin system with special emphasis to the bed nucleus of the stria terminalis
- V. Bruggeman, P. Van As and E. Decuypere 839 Developmental endocrinology of the reproductive axis in the chicken embryo
- Z. Zemanová, E. Ujec, Z. Jirsová and E. Maňáková 847 Indicators of functional differentiation of the chick embryonic kidney
- M.V. Nechaeva and T.M. Turpaev 861 Rhythmic contractions in chick amnio-yolk sac and snake amnion during embryogenesis
- General papers
- G.G. Thompson and P.C. Withers 871 Aerial and aquatic respiration of the Australian desert goby, *Chlamydogobius eremius*
- M.F.F. Bayomy, A.G. Shalan, S.D. Bradshaw, P.C. Withers, T. Stewart and G. Thompson 881 Water content, body weight and acid mucopolysaccharides, hyaluronidase and  $\beta$ -glucuronidase in response to aestivation in Australian desert frogs
- T. Fujimori and H. Abe 893 Physiological roles of free D- and L-alanine in the crayfish *Procambarus clarkii* with special reference to osmotic and anoxic stress responses
- F.J. Schweigert, M. Luppertz and W.T. Stobo 901 Fasting and lactation effect fat-soluble vitamin A and E levels in blood and their distribution in tissue of grey seals (*Halichoerus grypus*)
- J.D. Herbert, T.D. Coulson and R.A. Coulson 909 Growth rates of Chinese and American alligators

**X. Zhou, C. Niu, R. Sun and Q. Li**

917 The effect of vitamin C on the non-specific immune response of the juvenile soft-shelled turtle (*Trionyx sinensis*)

**M.R. Milnes, A.R. Woodward, A.A. Rooney and L.J. Guillette**

923 Plasma steroid concentrations in relation to size and age in juvenile alligators from two Florida lakes

I Contents of Vol. 131

VI Subject index

X Author index

XIII Instructions to Authors